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# ARMORED MEDICAL RESEARCH LABORATORY

FORT KNOX, KENTUCKY

INDEXED

Report On

PROJECT NO. 6 - VISION IN TANKS

Subject: Binocular Modification Providing Quick Adjustment  
of Interpupillary Distance and Diopter Setting

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Project No. 6

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ARMORED MEDICAL RESEARCH LABORATORY  
Fort Knox, Kentucky

Project No. 6  
SPMEA 741

15 October 1945

BINOCULAR MODIFICATION PROVIDING QUICK ADJUSTMENT  
OF INTERPUPILLARY DISTANCE AND DIOPTER SETTING

1. PROJECT NO. 6 - Vision in Tanks.

a. Authority: Letter Commanding General, Headquarters Armored Force, Fort Knox, Kentucky, File 400.112/6 CNOHD, dated September 24, 1942.

b. Purpose: To discuss need for binocular IPD and diopter adjustments especially for night operations and to describe one method of meeting the requirements.

2. DISCUSSION:

For efficient use of binoculars at night or during daylight it is necessary that both the IPD and diopter setting of the binoculars be adjusted for the person using them. Scales are provided for making the adjustments in daylight, and the scales are adequate for daylight use provided the user remembers the various settings. (It is surprising how few people remember their setting and depend on rough adjustment each time the binoculars are used). At night the scales are no longer readable, consequently this method of adjustment cannot be made without the use of artificial illumination. For security, artificial illumination cannot be used during most night operations, and it is of course, at such times that the need for proper adjustment of the binoculars is most important. Even if artificial illumination can be used for making the settings, its use is undesirable because of the risk of loss of dark adaptation.

In combat the binoculars may be taken out of the case, used and returned to the case many times in a short period. They must be adjusted each time they are used.

Clearly there is needed some means to permit quick and positive setting of the binocular IPD and diopter adjustments in total darkness. One method of doing this has been developed at this Laboratory and has been tried on GI 6x30-M3 Binoculars. The simple modifications made have proven quite adequate and have the virtue that they can be applied to existing binoculars without change. As they stand they represent an expression of an idea and not necessarily a fully designed item.

Essentially the modifications are adjustable detents which once adjusted can be reset by feel. Figure 1 shows modified binocular parts required and method of making initial adjustments.

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The Modified 6 x 30-M3 Binoculars are shown in Figure 1, the modification parts in Figure 2.

Figures 3, 4, 5 and 6 show method of initial adjustment and use.

Figure 7 shows range scale for correct individual focus at short range for daytime use. It is a useful but not essential feature.

### 3. CONCLUSIONS:

- a. There is a definite need for some means of quickly and positively making binocular IPD and diopter adjustment in complete darkness.
- b. The binocular modifications suggested meet the requirements of a. above.
- c. The modifications suggested can be easily applied to existing binoculars.
- d. As a production item the modifications could probably be more simply built into the binocular.
- e. The modifications are usable and advantageous for daytime use as well as night use.
- f. The distance scale incorporated in the diopter adjustment is useful for close-in viewing.
- g. The detent method of stop is considered superior to positive stops for the reason that the binoculars may be handed to someone else who can make adjustments without altering the adjustment setting of the principal user.

### 4. RECOMMENDATIONS:

- a. That the suggested modification (or variation accomplishing the same ends) for IPD and diopter setting be applied to binoculars for use by ground troop engaged in night operations.
- b. That, for future procurement, simplified version be designed into production binoculars for ground troop use.

NOTE: The recommendations as set forth in this project have been concurred in by Brigadier General George W. Reed, Jr., President, Army Ground Forces Board No. 2.

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Fig. 1

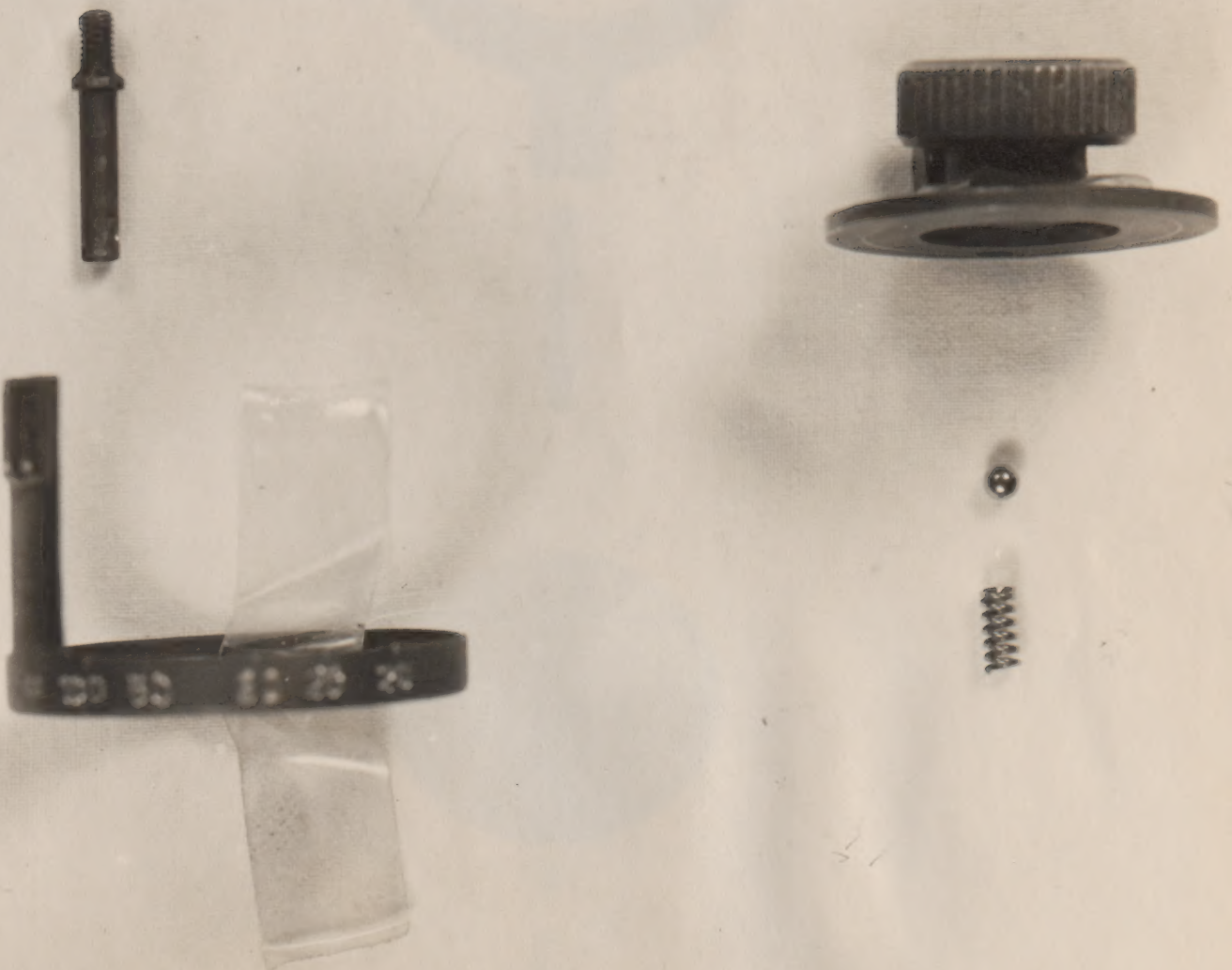
BINOCULAR WITH IPD AND DIOPTER ADJUSTMENT MODIFICATIONS  
(Note one diopter adjustment in detent--one out)





FIGURE 2

SIDE VIEW BINOCULAR IPD AND DIOPTER ADJUSTMENT PARTS









A

FIGURE 3

FIGURE 3

TOP VIEW BINOCULAR IFD AND DIOPTER ADJUSTMENT PARTS







FIGURE 4

(a) LOOSENING IPD ADJUSTER PRIOR TO MAKING ADJUSTMENT

(b) TIGHTENING IPD ADJUSTER AFTER MAKING ADJUSTMENT





FIGURE 5

ADJUSTING IPD OF BINOCULARS









FIGURE 6

- (a) LOOSENING EYE CUP PRIOR TO BINOCULAR DIOPTRER ADJUSTMENT
- (b) TIGHTENING EYE CUP AFTER DIOPTRER ADJUSTMENT





FIGURE 7

MAKING DIOPTER ADJUSTMENT





# I.P.D. & DIOPTER ADJUSTMENT PARTS FOR M6 BINOCULARS

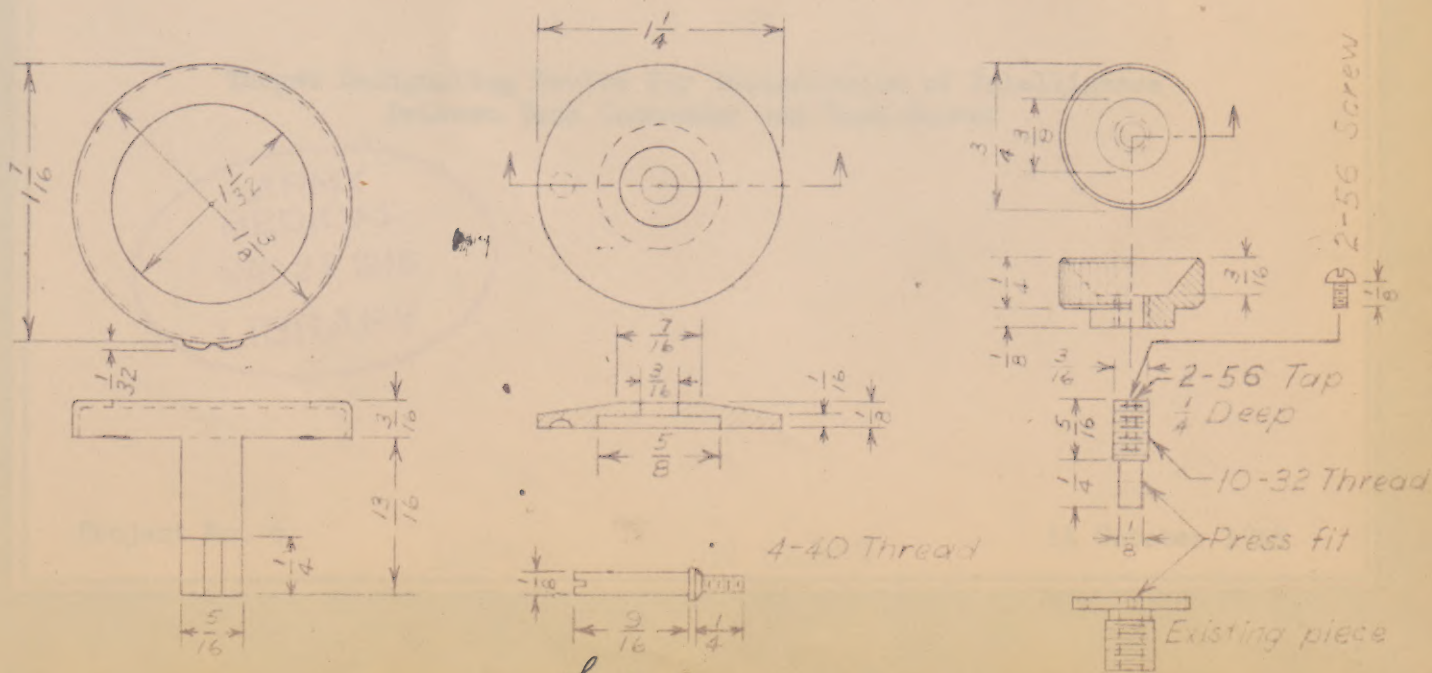
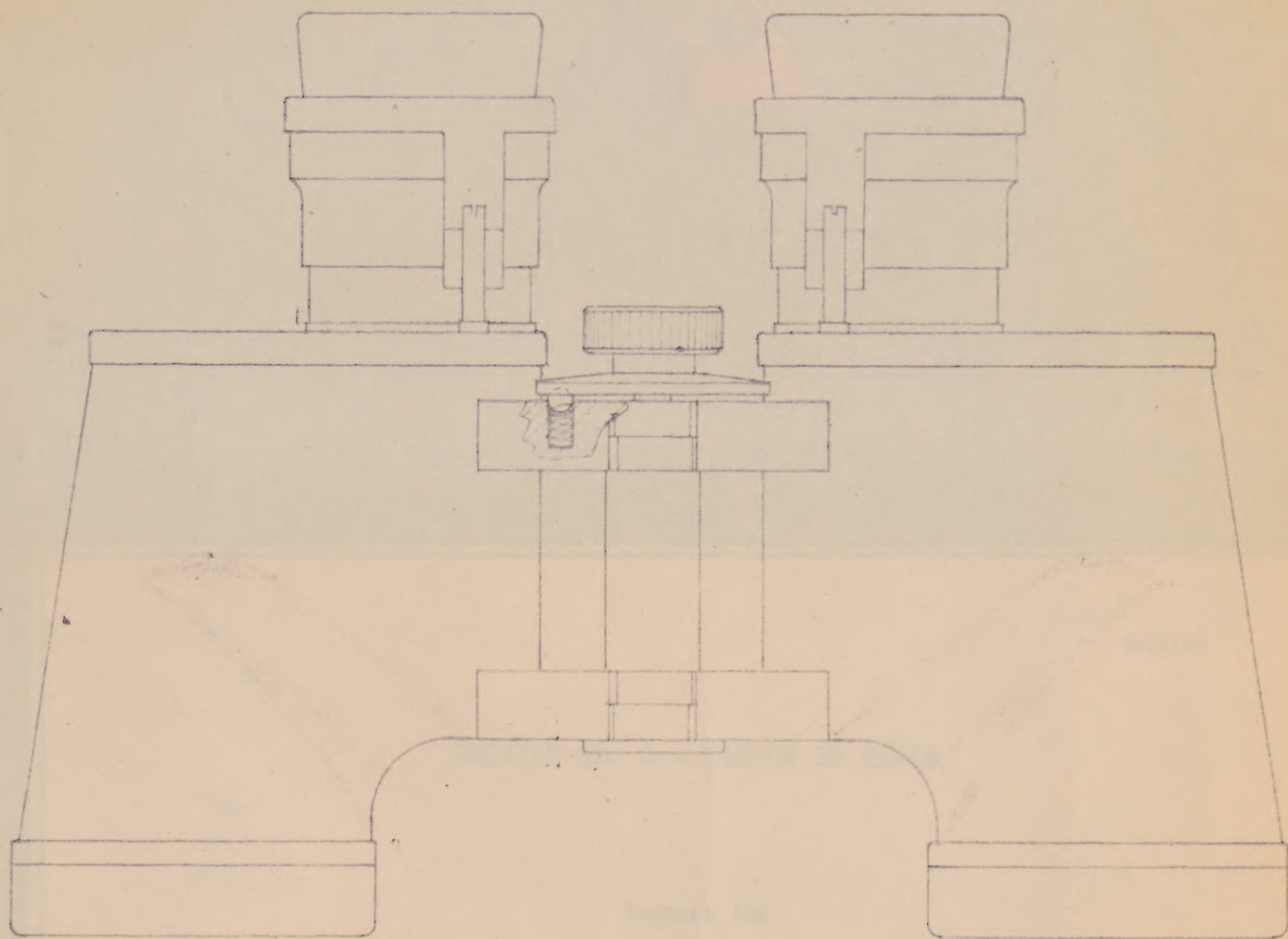


Fig 8.

